

Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1-11. (Canceled)

12. (Original) An image recognizing apparatus for detecting a shape of an object from an image, comprising:

an image database into which a shape identifier specifying the shape of the object and a model image, which is a image of the object having the shape, are preliminarily registered;

model generating means for extracting feature data of the shape from the model image;

a shape database for storing the feature of the shape with the shape identifier in a combination;

an image input unit for supplying an input image;

an image cutout unit for cutting out an image segment from the input image;

shape classifying means for comparing the image segment with the feature data of the shape to determine whether or not the object of the shape is present in the image segment;
and

an output unit for releasing data about the shape of the object determined by said shape classifying means and data about a position of the shape of the object in the input image.

13. (Original) The image recognizing apparatus according to claim 12, wherein said model generating means is operative to:

extract an average image of the model image of the shape and a variance of each pixel in the model image as the feature data of the shape; and

release a combination of the average image, the variance, and the shape identifier into the shape database.

14. (Original) An image recognizing apparatus for detecting a shape of an object from an image, comprising:

an image database preliminarily storing a shape identifier specifying the shape of the object and a model image which is an image of the object of the shape;

model generating means for calculating a base vector in a feature space from a pixel value of the model image, for projecting the model image in the feature space as a model image vector, for calculating a feature statistic value of the shape from the model image vector having the shape identifier as a feature shape parameter, and for adding the shape identifier to the feature shape parameter;

a shape database for storing the base vector, the feature shape parameter, and the shape identifier in a combination;

an image input unit for supplying an input image;

an image cutout unit for cutting out an image segment from the input image;

shape classifying means for projecting the image segment in the feature space to determine an image segment vector based on the base vector and for comparing the image segment vector with the model image using the feature shape parameter to determine whether or not the shape of the object is present in the image segment; and

an output unit for releasing data about the shape of the object and data about a position of the shape of the object in the input image when an object of which shape coincides the shape to be detected is present in the input image.

15. (Original) The image recognizing apparatus according to claim 14, wherein said model generating means is operative to calculate the feature shape parameter from an average vector and a covariance of the model image vector derived from the model image.

16. (Original) The image recognizing apparatus according to claim 14, wherein said model generating means is operative to calculate an average image of the model image, calculate a base vector from a pixel value of the average image, project the model image in the feature space as a model image vector, and add the shape identifier to the model image vector.

17. (Original) The image recognizing apparatus according to claim 14, wherein the shape identifier includes data indicating what portion of the object the shape is.

18. (Original) The image recognizing apparatus according to claim 17, wherein said shape classifying means is operative to estimate an overall area which the object occupies in the input image from the image segment of the shape identifier and sum up the overall area estimated for the image segment to output a position of the overall area of the object.

19. (Original) An image recognizing method for detecting a shape of an object from an image, comprising the steps of:

registering a shape identifier specifying the shape of the object to be identified and an image of the object having the shape as a model image into an image database;

extracting feature data of the shape from the model image;

releasing the feature data of the shape and the shape identifier in a combination into a shape database;

supplying an input image to be determined whether or not the object is present therein;

cutting out an image segment from the input image;

comparing the image segment with the feature data of the shape to determine whether or not the object of the shape to be identified is present in the image segment; and

releasing data about the shape of the object and data about a position of the shape of the object in the input image.